

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 91-006

WATER RECLAMATION REQUIREMENTS
FOR
UNITED TECHNOLOGIES CORPORATION, CHEMICAL SYSTEMS DIVISION
COYOTE CENTER, SANTA CLARA COUNTY
(RECLAMATION OF TREATED GROUNDWATER)

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

1. United Technologies Corporation, owns and operates the Chemical Systems Division located in central Santa Clara County as shown in Figure 1. The property is located in the eastern foothills of south Santa Clara County, approximately 5 miles southeast of the City of San Jose. The discharger develops, manufacturers, and tests solid rocket fuels and rocket motors. The site began operating in the late 1950's and occupies 5,200 acres including 180 buildings. This Order addresses the use of holding ponds 2140 located in Upper Shingle Valley and 2130 located in lower Mixer Valley for the storage and reclamation of treated groundwater. The discharger submitted a Report of Waste Discharge on November 6, 1990.
2. Station 0026 also known as pond 2140 is located along the northeast edge of Shingle Valley. The holding pond is bordered by ridge slopes to the northeast and Shingle Creek is located about 150 to 200 feet to the southwest. The pond is rectangular in shape and it is 135 feet long by 70 feet wide with a maximum depth of 8 feet (from crest to bottom). The pond was previously used for emergency storage of treated water from a Waste Water Treatment Plant. Also, it has a storage capacity of approximately 333,000 gallons.
3. The geology underneath this pond is underlain by Quaternary alluvial deposits of unconsolidated clays, silts, sands and gravels. The average permeability of the underlying soils beneath pond 0026 is approximately 10^{-5} cm/sec. If seepage occurs, this would create a mound and in so doing would have a beneficial impact by directing the chemical plume in Upper Shingle Valley towards the center of the valley where the groundwater extraction wells are located.
4. Monitoring wells were installed both upgradient and downgradient of pond 2140 to characterize the groundwater quality near the pond. Upgradient well 18Q1, located five feet from the north corner of pond 2140, away from the center of the valley was screened from 15 to 25 feet below the ground surface. The well was dry. Downgradient well 19B6 located 50 feet from the south corner of the pond was analyzed for volatile organic compounds and the results came out non detect. This well is screened between 15 and 25 feet.

5. Station 0730, also known as pond 2130 is bordered on the west by a ridge, on the south by an embankment and Manufacturing Road, and on the east by another ridge behind which is the San Felipe Road. The pond was previously used as an agricultural water storage pond. It has a holding capacity of approximately 14 million gallons. In addition, pond 2130 is located eastward of a chemical plume which is in Lower Mixer Valley.
6. The lithology of the soils underlying pond 2130 consists predominantly of low to high plasticity organic clays; the seepage from this pond is expected to be minimal. In addition, downgradient monitoring wells were analyzed for volatile organic compounds and the results were non detect.
7. Soil samples were taken from ponds 2140, and 2130 at two feet below the bottom of the ponds. The samples were analyzed for priority pollutants, total petroleum hydrocarbons (specifically gasoline and diesel) and pesticides. Volatile and semivolatile organic compounds were not detected in the soil samples.
8. The VOC contaminated groundwater throughout the site will be treated at four units located both at Shingle and Mixer Valley. Each treatment unit consists of an air stripper and carbon adsorption unit. The contaminated groundwater will be pumped through this treatment process before being discharged into the ponds. United Technologies Corporation, Chemical Systems Division will reclaim up to 300 gallons per minute of treated groundwater.
9. United Technologies Corporation, Chemical Systems Division will use the treated groundwater for landscape irrigation and pasture irrigation on-site, and for dust control and soil compaction at a construction site known as Silver Creek Country Club. The builder of this country club is Shea Homes Corporation. This Country Club is located near the intersection of Silver Creek and Yerba Buena Roads, approximately 8 miles north of Chemical Systems Division's Coyote Center.
10. California Water Code Section 13512 declares it is the intention of the Legislature that the State undertakes all possible steps to encourage development of water reclamation facilities so that reclaimed water may be made available to help meet the growing water demands of the State.
11. This action is being taken by the Board for the protection of natural resources, and involves no significant effect on the environment, and is thus categorically exempt from the

provisions of the California Environmental Quality Act in accordance with Title 14, California Administrative Code, Chapter 3, Section 15307.

12. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. This Order implements the water quality objectives stated in the Basin Plan.
13. The beneficial uses of Shingle and Las Animas Creeks which are tributary to Anderson Reservoir, a drinking water reservoir, located approximately one mile southeast of United Technologies property, include:
 - a. Municipal supply
 - b. Groundwater recharge
 - c. Recreation
 - d. Fish habitat
 - e. Wildlife habitat
14. The existing and potential beneficial uses of the groundwater underlying and adjacent to the facility include:
 - a. Industrial process water supply
 - b. Industrial service water supply
 - c. Municipal and Domestic water supply
 - d. Agricultural water supply
15. Under Resolution No. 88-160, the Regional Board urges the dischargers of extracted groundwater from groundwater cleanup projects to reclaim their effluent to the extent technically feasible.
16. The Board notified the discharger and interested agencies and persons of its intent to prescribe water reclamation requirements.
17. The Board, in a public hearing, heard and considered all comments pertaining to this matter.

IT IS HEREBY ORDERED, that the discharger shall meet the applicable provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and shall comply with the following:

A. Prohibitions

1. The treatment, storage, distribution or reuse of the treated groundwater shall not create a nuisance as defined in Section 13050 (m) of the California Water Code;

2. No reuse of treated groundwater shall be allowed to escape from the designated areas of irrigation via surface flow or airborne spray;
3. There shall be no cross-connection between potable water supply and any piping containing treated groundwater for reuse;
4. All equipment, including pumps, piping, valves and outlets should be color coded or otherwise marked to differentiate reclaimed water from domestic or other water;
5. No treated groundwater shall be applied to areas of reuse during rainfall, or when soils are saturated to a point where runoff is likely to occur;
6. The surface impoundments (ponds) shall be operated to have a minimum of 2 feet (measured vertically) of freeboard to prevent overtopping.

B. Water Uses

1. The reuse of treated groundwater in this Order are restricted to the following types of uses and areas:
 - a. Dust control, soil compaction, landscape irrigation and pasture irrigation to occur site-wide at Chemical Systems Division's Coyote Center;
 - b. Dust control and soil compaction at the Shea Homes development site, located near the intersection of Silver Creek and Yerba Buena Roads, approximately 8 miles north of Chemical Systems Division's Coyote Center;

Other reuse alternatives within the Chemical Systems Division site may be implemented pending written approval by the Executive Officer.

C. Reuse of Treated Groundwater Specifications

Producer - United Technologies

1. The Producer shall assure that the treated groundwater at all times is below or meets the drinking water action levels for volatile organic compounds.
2. Treatment of the groundwater shall consist of a stripping tower followed by a carbon adsorption unit or other

alternative remedial technology, approved by the Executive Officer, which would comply with the limits specified in C.1.

3. The Producer shall discontinue use of the treated groundwater if the limits specified in C.1 above are not met. Also, the delivery of treated groundwater by Shea Homes to their construction site, will also be discontinued until all conditions which caused the limits of C.1 to be violated have been corrected.
4. The producer shall not be allowed to discharge the treated groundwater into the holding ponds if it exceeds the drinking water action levels.
5. If the treatment system fails, the producer shall not allow:
 - a. The extracted contaminated groundwater to be discharged into the holding ponds;
 - b. Seepage to occur into the creek beds, resulting from the extraction pumps being turned off.

User - United Technologies and Shea Homes Construction Company

1. Treated groundwater shall not be used for public consumption.
2. Adequate measures shall be taken to minimize public contact with the reuse of treated groundwater and to inform the public by placing legible conspicuous warning signs with proper wording at adequate intervals around the use areas, unless public access is otherwise restricted.
3. Tank trucks used for carrying or spraying the treated groundwater shall be identified as such with legible warning signs.
4. Treated groundwater shall not be applied where it could contact drinking water facilities, or enter areas where food is handled or eaten or areas not under control of the user.
5. Animals, especially milking animals should not be allowed to graze on land irrigated with treated groundwater until it is thoroughly dry.
6. Irrigated areas shall be properly graded to minimize ponded water. Ditches must be maintained free of

emergent, marginal and floating vegetation.

D. Producer/User Agreements

1. Shea Homes Construction Company shall contact United Technologies Corporation, Chemical Systems Division to ensure that the treated groundwater will be made available to them. United Technologies Corporation shall be directly responsible for the effluent quality and Shea Homes Construction Company shall be responsible for the application of the treated groundwater. Shea Homes Construction Company shall fill out a Reclaimed Water Release Form when picking up the treated groundwater from United Technologies Corporation, Chemical Systems Division.
2. A copy of this Order must be provided to Shea Homes by United Technologies Corporation and both of these parties must have these Orders available at all times for inspection by the Regional Board Staff, or State/County Health Offices.

E. Provisions

1. The Producer shall submit an inspection program, subject to approval of the Executive Officer, to monitor User(s) compliance with this Order.
COMPLIANCE DATE: MARCH 16, 1991
2. The Producer shall provide employee training to assure compliance with this Order.
3. The Producer and User shall maintain in good working order and operate, as efficiently as possible, any facility or control system installed or as modified to achieve compliance with this Order.
4. United Technologies Corporation shall permit the Board or its authorized representatives, in accordance with Section 13267(c) of the California Water Code:
 - a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;
 - b. Access to and copy of, at reasonable times, any records that must be kept under the conditions of this Order;
 - c. Inspection, at reasonable times, of any facility, equipment (including monitoring and control equipment), practices, or operations regulated or

required under this Order; or
d. To photograph, sample or monitor, at reasonable times, for the purpose of assuring compliance with this Order.

5. In the event the Producer is unable to comply with any of the conditions of this Order due to:

- a. Breakdown of treated groundwater system (air stripper and/or carbon adsorption unit);
- b. Accidents caused by human error or negligence;
- c. Other causes such as acts of nature; or
- d. Facility operations;

The Producer shall notify this Board by telephone within 24 hours, of the incident and confirm it in writing within one week of the telephone notification.

6. In accordance with Section 13260 of the California Water Code, the Producer shall file a report with this Regional Board of any material change or proposed change in the character, location or volume of the reclaimed water.

7. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

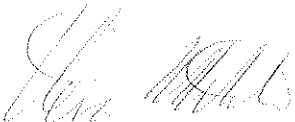
- a. Violation of any term or condition contained in this Order;
- b. Obtaining this order by misrepresentation, or failure to disclose fully all relevant facts;
- c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized reuse;
- d. Endangerment to public health or environment that can only be regulated to acceptable levels by Order modification or termination.

8. This Order is effective immediately upon adoption and supersedes the October 17, 1990 letter which gave temporary approval of the reuse of the treated groundwater.

9. In accordance with Section 13267 of the California Water Code, the discharger shall furnish, under penalty of perjury, technical monitoring program reports; such reports shall be submitted in accordance with specifications prepared by the Executive Officer.

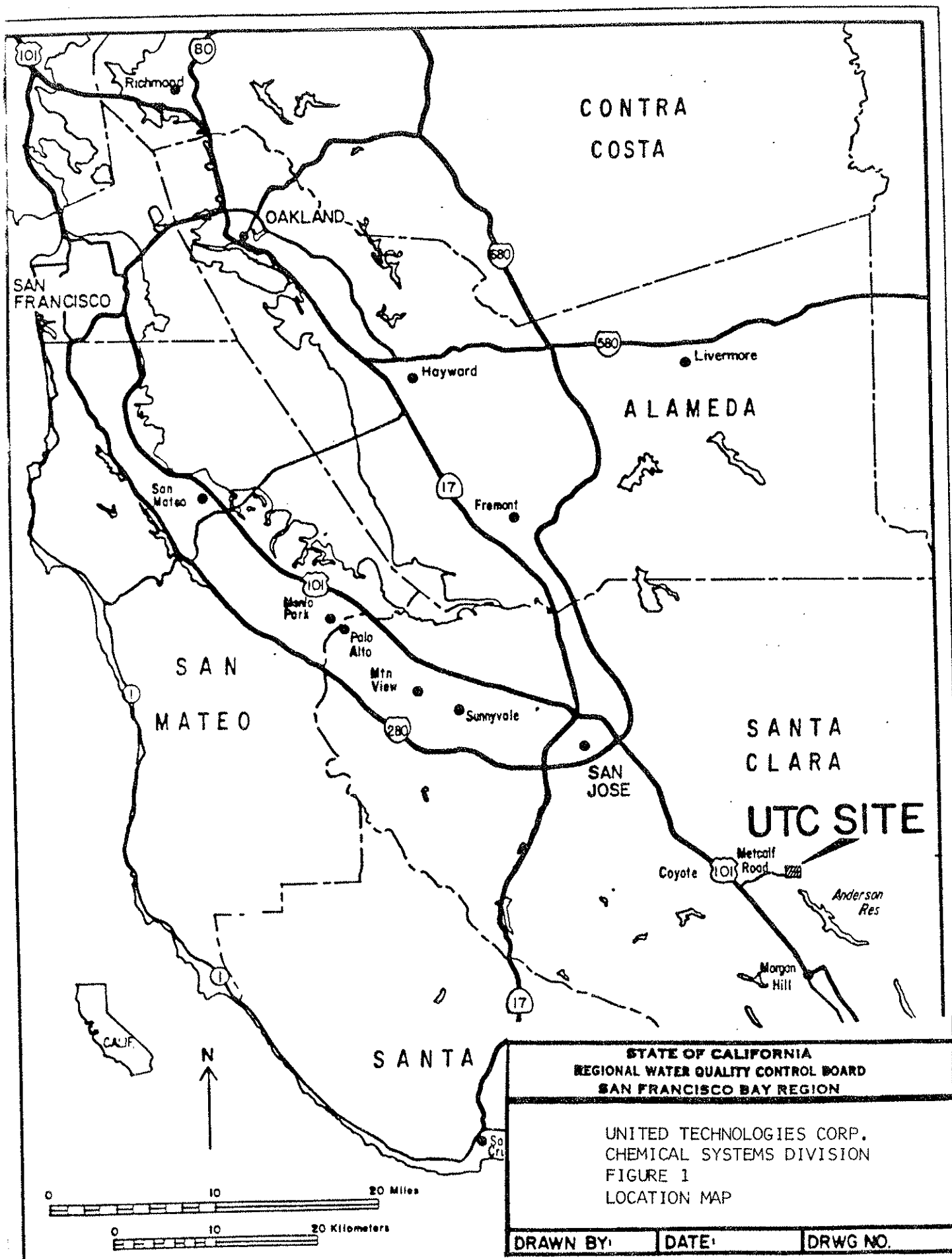
10. In accordance with Section 13263 of the California Water Code, these water reclamation requirements are subject to periodic review and revision by this Regional Board.
11. These requirements do not exempt the discharger from compliance with any other laws, regulations, or ordinances which may be applicable, and they leave unaffected any further restraints on this facility which may be contained in other statutes or required by other agencies.
12. The Producer shall file with the Regional Board self-monitoring reports performed according to any self-monitoring program issued by the Executive Officer.
13. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, specifications, and Provisions of this Order, shall be provided to the following agencies:
 - a. Santa Clara Valley Water District
 - b. Santa Clara County Health Department
 - c. State Department of Health Services/TSCD

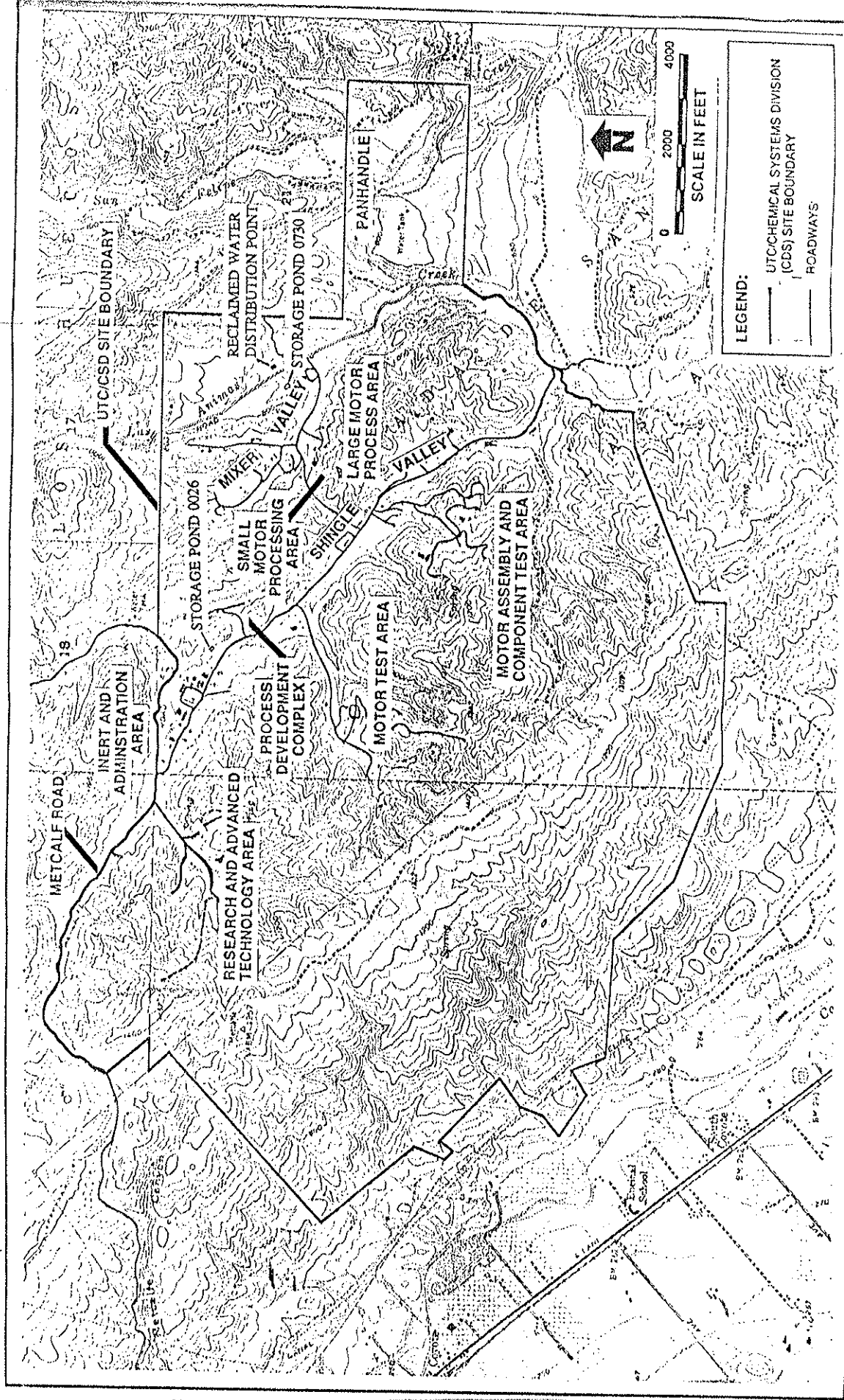
I, Steven R. Ritchie, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on January 16, 1991.


STEVEN R. RITCHIE
Executive Officer

Attachments:

- A. Location map
- B. Site holding pond map
- C. Guidelines for Worker Protection
- D. Reclaimed Water Release Form
- E. Self-Monitoring Program





STATE OF CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION		
UNITED TECHNOLOGIES CORPORATION CHEMICAL SYSTEMS DIVISION LOCATION OF PONDS FIGURE 2		
DRAWN BY:	DATE:	DRWG NO.

RECLAIMED WATER RELEASE FORM

PRODUCER

FACILITY _____

ADDRESS _____

PHONE _____

DISTRIBUTOR*

FACILITY _____

ADDRESS _____

PHONE _____

* User name if different _____

DATE

VOL. COLLECTED

USE AREA

TRUCK LIC. #

PRODUCER SIG.

COPIES OF THIS FORM SHALL BE KEPT AT PRODUCING FACILITY AND IN TRANSPORT VEHICLE

GUIDELINES FOR WORKER PROTECTION

(State Department of Health Services Guidelines)

- A. Workers should be informed that although reclaimed water has been treated to lower health risks, bacterial and viral contamination is still present and potentially may cause illness or infection. Contact with reclaimed water by ingestion, inhalation of mist, or on cuts or abrasions should be avoided, and the precautionary measures listed below should be carefully reviewed and followed.
- B. Precautionary measures should be taken to minimize worker contact with constituents of reclaimed water.
 - 1. Workers should not be subjected to reclaimed water sprays, mists or aerosols.
 - 2. Workers should be protected with protective clothing when there will be more than casual contact with the reclaimed water.
 - 3. Where oxidized, coagulated, clarified, filtered, disinfected wastewater is used, less stringent precautions may be allowed.
- C. Safe drinking water should be supplied for workers. Where bottled water is provided, the water should be in contamination-proof containers and protected from reclaimed water and dust.
- D. Handwashing facilities should be provided consisting of potable water supply, handwashing soap, and single use sanitary paper towels. The importance of handwashing should be stressed when working with reclaimed water, especially before eating or smoking.
- E. Workers should not apply reclaimed water by hand held nozzles or other hand held devices that can produce sprays, mists or aerosols.
- F. Precautions should be taken to avoid contamination of food taken into reclaimed water use areas. Food should not be taken into areas still wet with reclaimed water.
- G. Workers should be notified that reclaimed water is in use. Notification should include the posting of conspicuous warning signs with proper wording of sufficient size to be clearly read.

In those locations where English is not the primary language of the workers, the signs should be in the appropriate language as well as English.
- H. An adequate first aid kit should be available on location. Cuts or abrasions should be promptly washed, disinfected, and bandaged.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

RECLAMATION OF TREATED GROUNDWATER

ORDER NO. 91-006

JANUARY 16, 1991

I. GENERAL

Reporting responsibilities of waste discharges are specified in Sections 13225(a), 13267(b), 13268, 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16 and Resolution No. 88-160.

The principal purposes of a monitoring program are:

1. To document compliance with Water Reclamation Requirements and prohibitions established by this Regional Board; and
2. To facilitate self-policing by the User and Producer in Order No. 91-006 in the prevention and abatement of pollution arising from water reclamation.

II. Analyses of Ponds 2140 and 2130

Both Ponds 2140, and 2130 shall be analyzed on a monthly basis for the First Quarter for volatile organic compounds by using both EPA Method 8010 and EPA Method 8020. After which time, both ponds will be analyzed and monitored on a quarterly basis. The water levels in the ponds shall be measured bi-weekly for the First Quarter, after which time, it shall be measured weekly. In addition, the pH of the ponds will be analyzed weekly.

III. Monitoring Well Analysis

Monitoring of the upgradient and downgradient wells shall be monitored on a monthly basis for the First Quarter by the EPA test Methods 8010 and 8020; after which time, the wells will be analyzed on a quarterly basis. The water levels and pH in the wells shall also be reported during the time of sampling. This shall include downgradient wells 19B6, 19B5, AI2 for pond 2140 and downgradient wells 20H1, 20H2, 20H3, 20H4 for pond 2130. Upgradient wells that are to be monitored shall not have a distance greater than 30 feet from the ponds.

IV. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Self-Monitoring Reports

The Producer shall implement this monitoring program on the effective date of this Order. The first monitoring report under this program is due by May 15, 1991.

Written reports shall be filed regularly for each calendar quarter, and shall be submitted 45 days after the reporting quarter. If no analysis is required during the reporting period, or a well is dry, the report shall so state. The reports shall be comprised of the following:

a. Letter of Transmittal

A letter transmitting self-monitoring reports should accompany each report. Such a letter shall include a discussion of violations found during the quarter related to the reclaimed treated groundwater use program and actions taken for correcting violations. The letter shall contain a statement by the official of United Technologies Corporation, Chemical Systems Division, under penalty of perjury, that to the best of the signer's knowledge the report is true and correct.

b. Program Information

The following information should be included in the quarterly report:

1. A summary of monthly water releases to Shea Homes Construction Company. The Reclaimed Water Release Forms should accompany the summary.
2. A summary of effluent violations related to the treated groundwater reuse; violations found during inspection of User applications of reclaimed treated groundwater and corrective actions taken.
3. A summary of influent and effluent results from the treatment system (air stripper followed by carbon adsorption unit). Also, specify which treatment system is diverted to which pond.
4. Total volume of treated groundwater in ponds.
5. Results from the analyses of monitoring wells in Item III of page T-1. This includes the pH, water levels, the purge data sheets, and the analytical and chain of custody records.
6. Results from the analyses of the ponds, this includes the pH, water levels and volatile organic compound analyses, again including the analytical and chain of custody reports.
7. A summary of inspections of Users during the month. Refer to Item IV of page T-3.

2. Annual Report

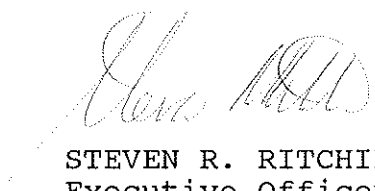
An annual report shall be submitted by January 30 or may be incorporated into the fourth quarter report. This report should summarize for the past calendar year all the information collected in the quarterly reports. It should also include a discussion of the overall success and weaknesses of the program, with recommendations for changes or improvements.

IV. INSPECTION PROGRAM

United Technologies Corporation, Chemical Systems Division shall conduct periodic random inspections of its site and the Country Club site to ensure compliance with this Order.

The observations must be made during the periods when application of treated groundwater is in progress. A proposed inspection program shall be submitted to the Board for approval by the Executive Officer within 60 days of the effective date of the Treated Groundwater Reclamation Requirements. An example of an inspection form is in Attachment A.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing Self-Monitoring Program is effective on the date shown below and may be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Producer, and revisions will be ordered by the Executive Officer.



STEVEN R. RITCHIE
Executive Officer

EFFECTIVE DATE: January 16, 1991

Attachments

A. Example of Inspection Program

State of California
Regional Water Quality Control Board
San Francisco Bay Region

INSPECTION CHECKLIST FOR WASTEWATER RECLAMATION OPERATION
(Conditional Waiver Projects)

Reclaimed Water Supplier:	Reclaimed Water User:

Date and Time of the inspection: _____
Specific Uses of the Reclaimed water: _____
Owner/Operator in presence: _____
Tank Trucks License Plate No.: _____
Weather Conditions: _____

Check the appropriate items listed below:

1. Treatment Level Received: ☐ secondary ☐ tertiary
2. Type of Application: ☐ tank truck ☐ spray ☐ wash water
 ☐ other (specify: _____)
3. Standard Observations:

	Yes	No	N/A
a. Reclaimed water is used in non-designated areas:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Odor nuisance:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Escape of reclaimed water to areas of potential public health hazards:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Saturated soils or ponding in the use areas:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Vehicles hauling reclaimed water is leaking or is not properly labelled with warning signs:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. User not carrying RWQCB authorization in vehicle or on site:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Reclaimed water is sprayed on buildings, vehicles, picnic tables, drinking fountains, etc.:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. When required, warning signs are not properly posted in the use areas:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Buffer zones from sensitive areas not maintained:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Broken pipes or spray nozzles:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If a "yes" is circled for any of the above, provide explanations below:

Additional notes: _____

Signature of Inspector: _____ Date: _____